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Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

SYNTHESIS OF ARABINOXYLAN FRAGMENTS

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The cell wall of plants can be termed the skeleton of the plant. One of the parts making up the cell wall is hemicellulose. Hemicellulose is composed of a number of saccharides where one of the most abundant are the arabinoxylan-oligosaccharides. In many instances the biosynthesis and degration of arabinoxylan oligosaccharides remain elusive. As a consequence defined arabinoxylan fragments have been chosen as synthetic targets which subsequently will be submitted to enzymatic studies. A better understanding of these processes could lead to e.g. better utilisation of the biomass for biofuel production, or production of commercial chemicals which are mainly obtained from fossil fuels today [1].

The arbinoxylan fragments have a backbone of β-1,4-linked xylans with α-L-arabinose units attached at specific positions. The synthesis ultilises an efficient synthetic route, where all the xylan units can be derived from D-xylose through a common intermediate. The xylan units feature the same thiophenyl donor functionality to allow for successive coupling with the same optimised glycosylation protocol [2]. Then, the arabinose units can be attached and global deprotection yields the target fragments.

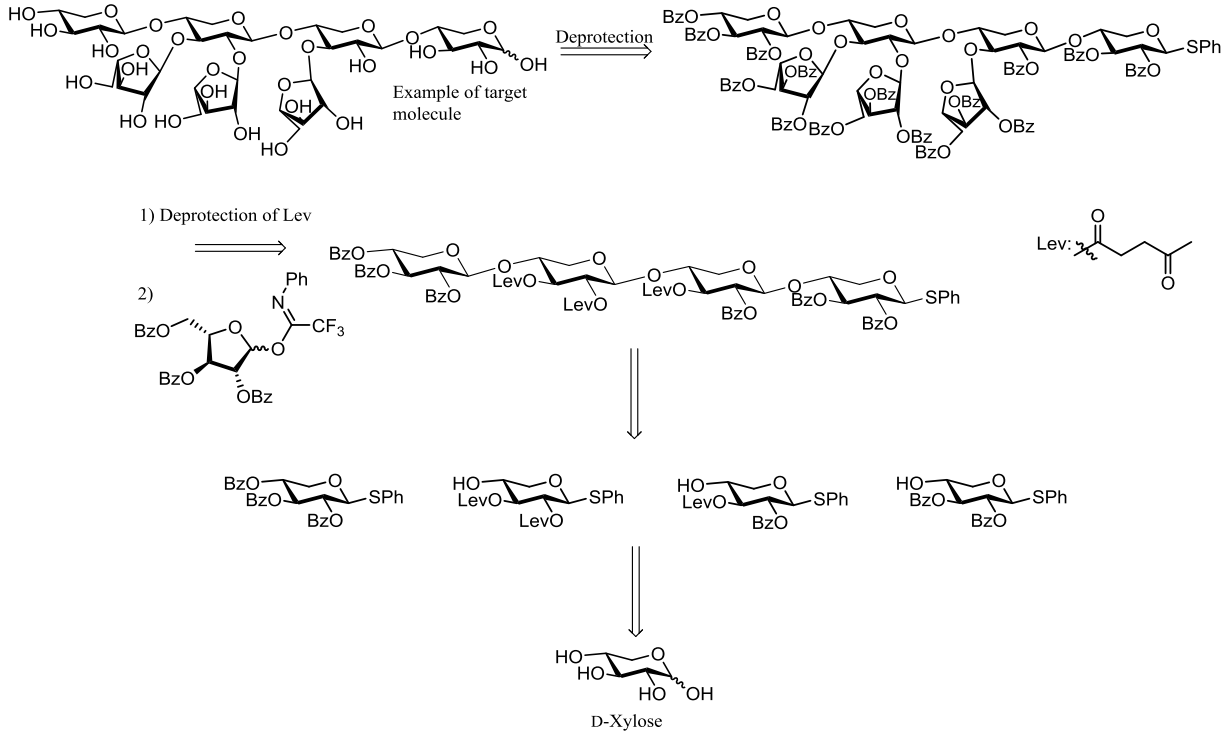

Figure 1: Retrosynthetic overview with one target as an example.

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[2] D. Crich; F. Cai; F. Yang; A stable, commercially available sulfenyl chloride for the activation of thioglycosides in conjunction with silver trifluoromethanesulfonate. Carbohydr. Res., **2008**, *343*, 1858-1862.